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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,817	02/11/2004	Kamal Tawfiq	FSU 10416.1	3356

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SENNIGER POWERS
ONE METROPOLITAN SQUARE
16TH FLOOR
ST LOUIS, MO 63102

EXAMINER

KIM, CHONG R

ART UNIT

PAPER NUMBER

2624

DATE MAILED: 06/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/776,817	Applicant(s) TAWFIQ ET AL. ~	
	Examiner Charles Kim	Art Unit 2624	✓

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
 4a) Of the above claim(s) 1-15 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-32 and 46 is/are allowed.
- 6) ☒ Claim(s) 33-45 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/11/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-15, drawn to inspecting a borehole by either quantifying a penetration on a bottom of a borehole, measuring a temperature, measuring electrical conductivity, measuring pressure exerted on the housing, or comparing weight of the camera and housing in slurry relative to air, classified in class 348, subclass 85.
 - II. Claims 16-46, drawn to inspecting a borehole by determining a density of the slurry based on the velocity of the camera or measuring the amount of deposit at the bottom of the borehole, classified in class 382, subclass 109.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination (invention I) does not recite the steps of either determining a velocity at which the camera assembly is lowered to determine the density of the slurry or determining an amount of a deposit at the bottom of the borehole, as required by the

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subcombination (invention II). The subcombination has separate utility such as determining a velocity at which the camera assembly is lowered to determine the density of the slurry or determining an amount of a deposit at the bottom of the borehole.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Robert Bain (Registration No. 36,736) on May 26, 2006, a provisional election was made without traverse to prosecute invention II, claims 16-46. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-15 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 17-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Referring to claim 17, the phrase “substantially less” in line 17 renders the claim indefinite because it is unclear what “substantially” means. A similar rejection is also applicable to claim 31.

Claims not mentioned specifically are dependent from indefinite antecedent claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 33-37, 39, 44, 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rademaker et al. U.S. Patent No. 5,485,745 (“Rademaker”), Nazzal et al, U.S. Patent No. 6,041,860 (“Nazzal”), and Ohmer, U.S. Patent No. 5,996,711 (“Ohmer”).

Referring to claim 33, Rademaker discloses a system for visually inspecting an interior surface of a construction bore hole comprising:

- a. a portable camera (102) for generating images of a portion of the interior surface of the bore hole and for generating signals representative of the generated images, the camera defining a viewing area adjacent the camera in which the images are generated (col. 5, lines 23-26 and figure 2)
- b. a light source (31) for illuminating at least a portion of the viewing area adjacent the camera thereby enabling the images of the interior surface of the bore hole to be generated by the camera (col. 5, lines 23-26 and figure 2)
- c. a housing (30) for the camera and the light source, the housing adapted to be lowered into the bore hole (col. 6, lines 66-67 and figure 2).
- d. a monitor (46) receiving and responsive to the signals from the camera for displaying the images generated by the camera (col. 5, line 67-col. 6, line 2).

Rademaker does not explicitly disclose a probe for use with the housing for measuring a penetration of the probe on a bottom of the borehole. Nazzal discloses a probe (212a, 212b) for use with the housing for measuring penetration on the bottom of the borehole (col. 5, lines 64-65). Nazzal does not expressly teach the step of obtaining an image of the probe. However, Nazzal explains that the probe (212a, 212b) is located below the camera (210) [figure 1]. Nazzal also explains that the camera can be rotated in a plane relative to an axis of the housing (col. 11, lines 53-54 and col. 12, lines 3-7). The Examiner notes that in the process of performing a comprehensive inspection of the interior region of the borehole, an ordinary artisan would image the borehole at a plurality of different angles. Thus, since the probe is located below the camera, it would have been obvious to image the probe in the process of capturing the images inside the borehole at different angles.

Rademaker and Nazzal are combinable because they are both concerned with borehole inspection systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the probe of Nazzal in the housing of Rademaker. The suggestion/motivation for doing so would have been to enhance the inspection process by determining the depth of the tool in the bore hole and obtaining the characteristics of the formation in the bore hole, thereby increasing the capabilities of the system (Nazzal, col. 5, lines 64-65 and col. 6, lines 4-18). Therefore, it would have been obvious to combine Rademaker with Nazzal.

Nazzal further explains that the probe can be used for determining the characteristics of the formation in the borehole (col. 6, lines 4-18), but does not explicitly state that the probe can be used for determining an amount of deposit at the bottom of the borehole. However,

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determining an amount of deposit at the bottom of a borehole was exceedingly well known in the art. For example, Ohmer discloses a probe for determining an amount of deposit (shale) at the bottom of a borehole (col. 4, lines 34-38).

Rademaker, Nazzal, and Ohmer are combinable because they are all concerned with borehole inspection systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the teachings of Ohmer in the system of Rademaker and Nazzal. The suggestion/motivation for doing so would have been to enhance the inspection process by providing the capability of determining an essential characteristic of the formation. Therefore, it would have been obvious to combine Rademaker and Nazzal with Ohmer to obtain the invention as specified in claim 33.

Referring to claim 34, Rademaker further discloses a video recorder for recording the images generated by the camera (col. 5, lines 54-60).

Referring to claim 35, Rademaker does not explicitly disclose that the monitor comprises a computer having a display. However, computer monitors for displaying images were exceedingly well known and common in the art. For example, Nazzal discloses a monitor comprising a computer having a display, to receive the images generated by the camera and displaying the images on its display (col. 12, lines 32-34).

Therefore, it would have been obvious to modify the monitor of Rademaker to include the computer monitor of Nazzal. The suggestion/motivation for doing so would have been to display the images on the computer monitor to adjust and fine tune the video images being viewed and recorded (Rademaker, col. 8, lines 5-8).

Referring to claim 36, Nazzal further discloses an image processor for acquiring an image of the interior surface of the bore hole from the images generated by the camera and for processing the acquired image (col. 6, lines 18-31).

Referring to claim 37, Nazzal further discloses that the images generated by the camera each include a plurality of pixels, the pixels each having a value representative of an optical characteristic of the images, and wherein the image processor processes the acquired image of the interior surface of the bore hole as a function of the pixel values (col. 6, lines 18-31).

Referring to claim 39, Rademaker further discloses a viewing envelope (54) positioned adjacent the camera, and external to the housing, the viewing envelope defining viewing area adjacent the camera, where the light source illuminates the viewing area (col. 6, lines 20-29 and col. 7, lines 60-64 and figure 2).

Referring to claim 44, Nazzal further discloses a motion control mechanism connected to a camera for controlling a viewing angle of the camera relative to an axis of the housing of the housing and comprising a rotational motion stage for tilting the viewing angle about the axis of the housing (col. 11, lines 53-54 and col. 12, lines 3-7. It is noted that rotating the camera inherently includes tilting it).

Referring to claim 45, Nazzal further discloses a motion control mechanism connected to a camera for controlling a viewing angle of the camera relative to an axis of the housing of the housing and comprising a rotational motion stage for rotating the viewing angle about the axis of the housing (col. 11, lines 53-54 and col. 12, lines 3-7).

7. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Rademaker et al. U.S. Patent No. 5,485,745 (“Rademaker”), Nazzal et al, U.S. Patent No. 6,041,860 (“Nazzal”), and Ohmer, U.S. Patent No. 5,996,711 (“Ohmer”), further in view of Smalser, U.S. Patent No. 5,754,220 (“Smalser”).

Referring to claim 38, Rademaker further discloses a power supply for operating and controlling the camera (col. 5, lines 64-67)), but does not explicitly state that the power supply is rechargeable. However, rechargeable power supplies were exceedingly well known and commonly used in the art. For example, Smalser discloses a rechargeable battery that supplies power a camera (col. 5, lines 18-22).

Therefore, it would have been obvious to include the rechargeable power supply of Smalser to power the camera of Rademaker, Nazzal, and Ohmer. The suggestion/motivation for doing so would have been to enhance the portability of the apparatus in facilitating its operation in remote areas (Smalser, col. 6, lines 54-57).

8. Claims 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of (“Rademaker”), Nazzal et al, U.S. Patent No. 6,041,860 (“Nazzal”), and Ohmer, U.S. Patent No. 5,996,711 (“Ohmer”), further in view of Lizanec, Jr., U.S. Patent No. 5,123,492 (“Lizanec”).

Referring to claim 40, Rademaker further discloses that the viewing envelope comprises a fluid chamber (col. 6, lines 20-29 and col. 7, lines 60-64 and figure 2. Note that the “isolated zone or pill of optically transparent fluid” is interpreted as a viewing envelope defining a fluid chamber), but does not explicitly disclose that the viewing envelope comprises a transparent

shell. However, this feature was exceedingly well known in the art. For example, Lizanec discloses an apparatus for inspecting an interior surface of a construction bore hole (col. 2, lines 53-57), that includes a camera (17) and a viewing envelope (21) external to the camera, wherein the viewing envelope comprises a transparent shell defining a viewing area adjacent the camera [col. 5, lines 36-60 and figure 7. Lizanec explains that the camera is positioned inside a visually clear casing (transparent shell)].

The Examiner notes that the combination of Rademaker and Lizanec would provide a system that includes the housing, camera, and light source of Rademaker positioned within the transparent shell (viewing envelope) of Lizanec. Rademaker explains that an optically clear fluid is pumped from a nozzle (32) towards the lower end of the device to form an optically transparent isolated region (Rademaker, col. 6, lines 15-23 and figure 2). The transparent shell of Lizanec would have been filled with the optically clear fluid pumped by the nozzle of Rademaker, thereby providing a viewing envelope positioned adjacent to the camera, and external to the housing, wherein the viewing envelope comprises a transparent shell defining a fluid chamber.

Rademaker and Lizanec are both concerned with bore hole inspection systems. Rademaker explains that an isolated zone or region of optically transparent fluid formed around the inspection tool is desirable (Rademaker, col. 6, lines 20-22). The Examiner notes that Lizanec's clear casing would enhance Rademaker's system by providing a transparent chamber (clear casing) that holds the fluid, thereby allowing inspection without any obstruction from the opaque fluids inside the bore hole (Rademaker, col. 6, lines 25-29). Lizanec further provides a low cost installation system that allows visual inspection for a variety of different types of bore

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holes (Lizanec, col. 3, lines 5-24). Therefore, it would have been obvious to combine the teachings of Rademaker and Lizanec, in order to enhance the inspection of the interior surface of a construction bore hole with a low cost and flexible system.

Referring to claim 41, Rademaker further discloses that the fluid chamber of the viewing envelope is filled with water (col. 6, lines 20-22 and lines 37-38).

Referring to claim 42, Lizanec further discloses that the transparent shell comprises a rigid plastic (col. 4, lines 3-6).

Referring to claim 43, Rademaker and Lizanec fail to teach that the transparent shell comprises a flexible plastic. Official notice is taken that flexible plastic was exceedingly well known in the art. Therefore, it would have been obvious to include a transparent shell that is comprised of flexible plastic, in order to enhance the inspection process by increasing the flexibility of the system.

Allowable Subject Matter

9. Claim 16 is allowed.

10. Claims 17-32 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

11. Claim 46 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Edwards et al., U.S. Patent No. 6,307,199 discloses a borehole inspection system that determines the density of slurry.

b. Berger et al., U.S. Patent No. 6,157,896 discloses a borehole inspection system that determines the density of slurry (col. 7, lines 50-60 and col. 12, lines 1-7).

c. Tubel et al., U.S. Patent No. 6,281,489 discloses a borehole inspection system for monitoring parameters of the borehole.

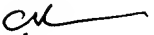
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 571-272-7421. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-272-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


ck
May 31, 2006


JINGGEWU
PRIMARY EXAMINER